

WHAT IS CLAIMED IS:

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1. A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, said process cartridge comprising:

5 a cartridge frame;  
an electrophotographic photosensitive drum;  
a charging member for electrically charging said photosensitive drum;

10 a developing member for developing an electrostatic latent image formed on said photosensitive drum;

15 a developer accommodating portion for accommodating a developer to be used for developing the electrostatic latent image by said developing member;

20 an engaging member for being supported by a receiving portion of a movable member provided in the main assembly of said apparatus when said engaging member is in the main assembly of said apparatus, wherein said engaging member is provided on a portion of said cartridge frame which (takes an upper position) when said process cartridge is inserted into the main assembly of the apparatus in a longitudinal direction thereof, (at such a position as takes a downstream end position) in a direction of insertion of said cartridge

25 into the main assembly of said apparatus;

a first guide portion provided on a portion

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a third guiding portion provided on a portion of said cartridge frame which (takes a lower position) when said cartridge is inserted into the main assembly of the apparatus in the longitudinal direction of said photosensitive drum, (at such a position as takes an upstream position) in the direction of insertion of said cartridge, wherein said third guide portion is

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guided by a second guide recess provided in the main assembly of the apparatus when said cartridge is inserted into the main assembly of the apparatus;

5 a driving force receiving member provided at a downstream end portion with respect to the direction of insertion, wherein said driving force receiving member receives a driving force from a driving force transmitting member provided in the main assembly of apparatus; and

10 a positioning portion which is projected from said cartridge frame toward an upstream side with respect to the direction of insertion, wherein said positioning portion is disposed coaxially with said photosensitive drum, and wherein when said engaging member supported by said receiving portion is released to permit said cartridge to lower to the mount position, said positioning portion is supported by a positioning recess provided in the main assembly of the apparatus.

20 2. A process cartridge Claim 1, wherein said second guide portion and said third guide portion are provided in said cartridge frame portion having said developer accommodating portion, and said engaging member and said first guide portion are provided in said cartridge frame portion an opposite cartridge frame portion.

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3. A process cartridge Claim 1 or 2, wherein by operating a lever provided in the main assembly of the apparatus, the movable member is lowered, and said engaging member supported by said receiving portion is released, so that cartridge lowers to the mount position from the position in which it is inserted into the main assembly of apparatus.

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10 4. A process cartridge Claim 3, wherein when the cartridge lowers, said second guide portion is in engagement with said first guide recess, and said third guide portion is in engagement with said second guide recess, and said cartridge lowers by rotation about said second guide portion and a third guide portion to the mount position.

20 5. A process cartridge according to Claim 1, 2 or 3, wherein said engaging member is projected upworldly beyond a top side of said cartridge frame portion and is projected in the direction of insertion beyond a leading end surface of said cartridge frame portion, wherein said leading end surface is a surface which takes a leading position when said cartridge is inserted into the main assembly of the apparatus,

25 wherein said top side is a side which takes a top position when said cartridge is inserted into the main assembly of the apparatus.

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6. A process cartridge Claim 5, wherein said engaging member is integrally formed with a leading end cover constituting said cartridge frame, and wherein said engaging member has a cylindrical configuration, wherein said leading end cover takes a leading end position when said cartridge is inserted into the main assembly of the apparatus.

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7. A process cartridge according to Claim 1, 2 or 3, wherein said first guide portion is projected beyond in a side surface of said cartridge frame portion in a direction crossing with the direction of insertion, and said first guide portion has a horizontal projected portion which is substantially parallel with a top side of said cartridge frame portion and a downward projected portion which projects downwardly from said horizontal projected portion, said downward projected portion has a bottom end for being guided by said guide fixed in the main assembly.

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8. A process cartridge Claim 7, wherein said first guide portion is integrally formed with a leading end cover and a cleaning frame which constitute said cartridge frame, wherein the leading end cover takes a leading end position when said cartridge is inserted into the main assembly of the

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apparatus.

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9. A process cartridge according to Claim 1, 2  
or 3, wherein said second guide portion is projected  
5 downwardly from a bottom side of said cartridge frame  
portion, and a leading end portion of said second  
guide portion is engageable with a hole provided in  
the main assembly of the apparatus, wherein the bottom  
side takes a bottom position when said cartridge is  
10 inserted into the main assembly of the apparatus.

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10. A process cartridge Claim 9, wherein said  
second guide portion is formed integrally with a  
leading end cover constituting said cartridge frame,  
15 wherein the leading end cover takes a leading end  
position when said cartridge is inserted into the main  
assembly of the apparatus.

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11. A process cartridge according to Claim 1, 2  
20 or 3, wherein said third guide portion is projected  
downwardly from a bottom side of said cartridge frame  
portion, wherein the bottom side takes a bottom  
position when said cartridge is inserted into the main  
assembly of the apparatus.

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12. A process cartridge Claim 11, wherein said  
third guide portion is formed integrally with a

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trailing end cover constituting said cartridge frame,  
wherein the trailing end cover takes a trailing end  
position when said cartridge is inserted into the main  
assembly of the apparatus.

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13. A process cartridge according to any one of  
Claims 1, 7, 9 and 11, wherein a top side of said  
cartridge frame is provided with a first grip for  
being gripped when said cartridge is carried, and a  
training end portion of said cartridge frame is  
provided with a second grip for being gripped when  
said cartridge is inserted into or taken out of the  
main assembly of the apparatus.

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14. A process cartridge according to any one of  
Claims 1, 7, 9, 11 and 13, further comprising a  
positioning member provided at a leading end side with  
respect to the direction of insertion of the process  
cartridge, the positioning member extending so as to  
enclose said driving force receiving member, wherein a  
part of said positioning member is engaged with a  
positioning recess provided in the main assembly of  
the apparatus to be correctly position at a mount  
position in the main assembly of the apparatus.

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15. A process cartridge Claim 1, wherein said  
process cartridge moves from the mount position

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through 100 $\mu$  - 1mm in a direction crossing with the  
direction of the insertion, when said driving force  
receiving member is centered relative to said driving  
force transmitting member by receiving the driving  
5 force from said driving force transmitting member.

16. An electrophotographic image forming  
apparatus for forming an image on the recording  
material, to which a process cartridge is detachably  
10 mountable, said apparatus comprising:

- (a) a lever;
- (b) a movable member interrelated with said  
lever, said movable member having a receiving portion;
- (c) a fixed guide fixed in the main assembly;
- 15 (d) a first guide recess;
- (e) a second guide recess;
- (f) a positioning recess provided in the main  
assembly;
- (g) a driving force transmitting member;
- 20 (h) a process cartridge mounting portion for  
detachably mountable said process cartridge, said  
cartridge including;
  - a cartridge frame;
  - an electrophotographic photosensitive drum;
  - 25 a charging member for electrically charging  
said photosensitive drum;
  - a developing member for developing an

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electrostatic latent image formed on said  
photosensitive drum;

5 a developer accommodating portion for  
accommodating a developer to be used for developing  
the electrostatic latent image by said developing  
member;

10 an engaging member for being supported by a  
receiving portion of a movable member provided in the  
main assembly of said apparatus when said engaging  
member is in the main assembly of said apparatus,  
wherein said engaging member is provided on a portion  
of said cartridge frame which takes an upper position  
when said process cartridge is inserted into the main  
assembly of the apparatus in a longitudinal direction  
15 thereof, at such a position as takes a downstream end  
position in a direction of insertion of said cartridge  
into the main assembly of said apparatus;

20 a first guide portion provided on a portion  
of said cartridge frame which takes an upper position  
when said cartridge is inserted into the main assembly  
of said apparatus in the longitudinal direction of  
said photosensitive drum, at such a position as takes  
a downstream position with respect to the direction of  
insertion of said cartridge, wherein said first guide  
25 portion is guided by a main assembly fixed guide  
provided in the main assembly of said apparatus;

a second guide portion provided on a portion

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of said cartridge frame which takes a lower position when said cartridge is inserted into the main assembly of said apparatus in the longitudinal direction of said photosensitive drum, at such a position as takes

5 a downstream position with respect to the insertion of said cartridge, wherein said second guide portion is guided by a first guide recess provided in the main assembly of apparatus when said cartridge is inserted into the main assembly of the apparatus;

10 a third guiding portion provided on a portion of said cartridge frame which takes a lower position when said cartridge is inserted into the main assembly of the apparatus in the longitudinal direction of said photosensitive drum, at such a position as takes an

15 upstream position in the direction of insertion of said cartridge, wherein said third guide portion is guided by a second guide recess provided in the main assembly of the apparatus when said cartridge is inserted into the main assembly of the apparatus;

20 a driving force receiving member provided at a downstream end portion with respect to the direction of insertion, wherein said driving force receiving member receives a driving force from a driving force transmitting member provided in the main assembly of

25 apparatus; and

a positioning portion which is projected from said cartridge frame toward an upstream side with

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respect to a direction of insertion, wherein said positioning portion is disposed coaxially with said photosensitive drum, and wherein when said engaging member supported by said receiving portion is released  
5 to permit said cartridge to lower to the mount position, said positioning portion is supported by a positioning recess provided in the main assembly of the apparatus;

10 17. An apparatus according to Claim 16, wherein said fixed guide is disposed adjacent one end of said cartridge mounting portion with respect to a direction crossing with the direction of insertion, and is extended in the direction of insertion from an inlet  
15 side for insertion of the process cartridge to the cartridge mounting portion toward a rear side, wherein said fixed guide is provided with a recess engageable with said first guide portion.

20 18. An apparatus according to Claim 16 or 17, wherein said first guide recess and said second guide recess are disposed adjacent the other end portion of said cartridge mounting portion with respect to a direction crossing with the direction of insertion,  
25 wherein said second guide recess is disposed adjacent an entrance portion of said mounting portion, and said first guide recess is disposed at a rear side of said

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mounting portion, and wherein a flat guide portion is provided between said first guide recess said second guide recess.

5        19. A cartridge mounting method for mounting a process cartridge to a main assembly of an electrophotographic image forming apparatus, said method comprising:

10            (a) a step of providing in the main assembly of said electrophotographic image forming apparatus a lever,

          a movable member interrelated with said lever and having a receiving portion

15            a fixed guide,  
          a first guide recess,  
          a second guide recess,  
          a positioning recess and  
          a driving force transmitting member;

20            (b) a step of providing in the process cartridge,

          a cartridge frame,  
          an electrophotographic photosensitive drum,  
          a charging member for electrically charging said photosensitive drum,

25            a developing member for developing an electrostatic latent image formed on said photosensitive drum,

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a developer accommodating portion for  
accommodating a developer to be used for developing  
the electrostatic latent image by said developing  
member,

5 an engaging member for being supported by  
said receiving portion when said engaging member is in  
the main assembly of said apparatus, wherein said  
engaging member is provided on a portion of said  
cartridge frame which takes an upper position when said  
10 process cartridge is inserted into the main assembly  
of the apparatus in a longitudinal direction thereof,  
at such a position as takes a downstream end position  
in a direction of insertion of said cartridge into the  
main assembly of said apparatus;

15 a first guide portion provided on a portion  
of said cartridge frame which takes an upper position  
when said cartridge is inserted into the main assembly  
of said apparatus in the longitudinal direction of  
said photosensitive drum, at such a position as takes  
20 a downstream position with respect to the direction of  
insertion of said cartridge, wherein said first guide  
portion is guided by said fixed guide when said  
cartridge is being inserted into the main assembly of  
said apparatus;

25 a second guide portion provided on a portion  
of said cartridge frame which takes a lower position  
when said cartridge is inserted into the main assembly

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of said apparatus in the longitudinal direction of  
said photosensitive drum, at such a position as takes  
a downstream position with respect to the insertion of  
said cartridge, wherein said second guide portion is  
5 guided by a first guide recess said cartridge is  
inserted into the main assembly of the apparatus,

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a third guiding portion provided on a portion  
of said cartridge frame which takes a lower position  
when said cartridge is inserted into the main assembly  
10 of the apparatus in the longitudinal direction of said  
photosensitive drum, at such a position as takes an  
upstream position in the direction of insertion of  
said cartridge, wherein said third guide portion is  
guided by a second guide recess when said cartridge is  
15 inserted into the main assembly of the apparatus,

a driving force receiving member provided at  
a downstream leading end portion with respect to the  
direction of insertion, wherein said driving force  
receiving member receives a driving force from a  
20 driving force transmitting member, and

a positioning portion which is projected from  
said cartridge frame toward an upstream side with  
respect to a direction of insertion, wherein said  
positioning portion is disposed coaxially with said  
25 photosensitive drum, and wherein when said engaging  
member supported by said receiving portion is released  
to permit said cartridge to lower to the mount

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position, said positioning portion is supported by a positioning recess provided in the main assembly of the apparatus; and

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5 (c) a step of inserting said process cartridge into the main assembly of said apparatus with said first guide portion being guided by said fixed guide, with said second guide portion being guided by said first guide recess, and with said second guide portion being guided by said second guide recess; causing said engaging member to be supported by said receiving portion; and thereafter, releasing said engaging member from said receiving portion by operating said movable member, so that cartridge is (let fall) to the mount position.

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20. A cartridge mounting method according to Claim 19, wherein said second guide portion and said third guide portion are provided in said cartridge frame portion having said developer accommodating portion, and said engaging member and said first guide portion are provided in said cartridge frame portion an opposite cartridge frame portion.

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21. A cartridge mounting method according to Claim 19 or 20, wherein by operating a lever provided in the main assembly of the apparatus, the movable member is lowered, and said engaging member supported

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by said receiving portion is released, so that cartridge lowers to the mount position from the position in which it is inserted into the main assembly of apparatus.

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22. A cartridge mounting method according to Claim 21, wherein when the cartridge lowers, said second guide portion is in engagement with said first guide recess, and said third guide portion is in engagement with said second guide recess, and said cartridge lowers by rotation about said second guide portion and a third guide portion to the mount position.

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23. A cartridge mounting method according to Claim 19, 20, 21 or 22, wherein said engaging member is projected upwardly beyond a top side of said cartridge frame portion and is projected in the direction of insertion beyond a leading end surface of said cartridge frame portion, wherein said leading end surface is a surface which takes a leading position when said cartridge is inserted into the main assembly of the apparatus, wherein said top side is a side which takes a top position when said cartridge is inserted into the main assembly of the apparatus.

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24. A cartridge mounting method according to



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Claim 23, wherein said engaging member is integrally formed with a leading end cover constituting said cartridge frame, and wherein said engaging member has a cylindrical configuration, wherein said leading end

5 cover takes a leading end position when said cartridge is inserted into the main assembly of the apparatus.

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10 25. A cartridge mounting method according to Claim 19, 20 or 21, wherein said first guide portion is projected beyond in a side surface of said cartridge frame portion in a direction crossing with the direction of insertion, and said first guide

15 portion has a horizontal projected portion which is substantially parallel with a top side of said cartridge frame portion and a downward projected portion which projects downwardly from said horizontal projected portion, said downward projected portion has a bottom end for being guided by said guide fixed in the main assembly.

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25 26. A cartridge mounting method according to Claim 25, wherein said first guide portion is integrally formed with a leading end cover and a cleaning frame which constitute said cartridge frame, wherein the leading end cover takes a leading end position when said cartridge is inserted into the main assembly of the apparatus.

27. A cartridge mounting method according to Claim 19, 20 or 21, wherein said second guide portion is projected downwardly from a bottom side of said cartridge frame portion, and a leading end portion of said second guide portion is engageable with a hole provided in the main assembly of the apparatus, wherein the bottom side takes a bottom position when said cartridge is inserted into the main assembly of the apparatus.

28. A cartridge mounting method according to Claim 19, wherein said second guide portion is formed integrally with a leading end cover constituting said cartridge frame, wherein the leading end cover takes a leading end position when said cartridge is inserted into the main assembly of the apparatus.

29. A cartridge mounting method according to Claim 19, 20 or 21, wherein said third guide portion is projected downwardly from a bottom side of said cartridge frame portion, wherein the bottom side takes a bottom position when said cartridge is inserted into the main assembly of the apparatus.

30. A cartridge mounting method according to Claim 29, wherein said third guide portion is formed integrally with a trailing end cover constituting said

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cartridge frame, wherein the trailing end cover takes a trailing end position when said cartridge is inserted into the main assembly of the apparatus.

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5 31. A cartridge mounting method according to any one of Claims 19, 25, 27 and 29, wherein a top side of said cartridge frame is provided with a first grip for being gripped when said cartridge is carried, and a training end portion of said cartridge frame is  
10 provided with a second grip for being gripped when said cartridge is inserted into or taken out of the main assembly of the apparatus.

15 32. A cartridge mounting method according to any one of Claims 19, 25, 27 and 29, further comprising a positioning member provided at a leading end side with respect to the direction of insertion of the process cartridge, the positioning member extending so as to enclose said driving force receiving member, wherein a  
20 part of said positioning member is engaged with a positioning recess provided in the main assembly of the apparatus to be correctly position at a mount position in the main assembly of the apparatus.

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25 33. A cartridge mounting method according to Claim 19, wherein said process cartridge moves from the mount position through 100μ - 1mm in a direction

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crossing with the direction of the insertion, when  
said driving force receiving member is centered  
relative to said driving force transmitting member by  
receiving the driving force from said driving force  
transmitting member.

34. A cartridge mounting method according to  
Claim 19, wherein said fixed guide is disposed  
adjacent one end of said cartridge mounting portion  
with respect to a direction crossing with the  
direction of insertion, and is extended in the  
direction of insertion from an inlet side for  
insertion of the process cartridge to the cartridge  
mounting portion toward a rear side, wherein said  
fixed guide is provided with a recess engageable with  
said first guide portion.

35. A cartridge mounting method according to  
Claim 19 or 17, wherein said first guide recess and  
said second guide recess are disposed adjacent the  
other end portion of said cartridge mounting portion  
with respect to a direction crossing with the  
direction of insertion, wherein said second guide  
recess is disposed adjacent an entrance portion of  
said mounting portion, and said first guide recess is  
disposed at a rear side of said mounting portion, and  
wherein a flat guide portion is provided between said

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first guide recess said second guide recess.

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